

## CLAIMS

We claim:

1. A vaccine composition comprising at least one peptide consisting essentially of an amino acid sequence of glucosyltransferase comprising an amino acid  
5 selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, an equivalent of aspartate 562, an equivalent of aspartate 567, an equivalent of histidine 561, an equivalent of tryptophan 491, an equivalent of glutamate 489, and combinations thereof, and which is of sufficient length to raise an immune response in a mammal to whom it is  
10 administered.
2. A vaccine composition according to Claim 1 wherein the amino acid sequence is selected from the group consisting of:
  - a) ANDHLSILEAWSNDNDTPYLHD (SEQ ID NO: 1); and
  - b) VPSYSFIRAHDSEVQDLIA (SEQ ID NO: 2).
- 15 3. A vaccine composition comprising at least one peptide consisting essentially of TGARTINGQLLYFRANGVQVKG (SEQ ID NO: 3).
4. A vaccine composition according to Claim 1 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.
- 20 5. A vaccine composition comprising at least two peptides covalently attached to a peptidyl core matrix, wherein each peptide consists essentially of an amino acid sequence of glucosyltransferase comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, an equivalent of aspartate 562, an equivalent of aspartate 567, an equivalent of histidine 561, an equivalent of tryptophan 491, an equivalent of  
25 glutamate 489, and combinations thereof, and which is of sufficient length to raise an immune response in a mammal to whom it is administered.

6. A vaccine according to Claim 5 wherein the amino acid sequence is selected from the group consisting of:
  - a) ANDHLSILEAWSNDTPYLHD (SEQ ID NO: 1); and
  - b) VPSYSFIRAHDSEVQDLIA (SEQ ID NO: 2).
- 5 7. A vaccine composition according to Claim 5 further comprising at least one additional immunologic component covalently attached to said peptidyl core matrix.
8. A vaccine composition according to Claim 5 wherein the additional immunologic component is an immunogenic portion of a pathogen selected from  
10 the group consisting of diphtheria, pertussis, tetanus, measles and poliovirus.
9. A vaccine composition according to Claim 5 wherein the peptidyl core matrix comprises at least one lysine.
10. A vaccine composition according to Claim 1 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or  
15 accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.
11. A vaccine composition according to Claim 5 wherein the immune response is to glucosyltransferase and results in the reduction of the colonization or  
20 accumulation of mutans streptococcal strains in a mammal to whom the vaccine composition is administered.
12. A method of provoking an immune response to glucosyltransferase in mammals comprising administering a peptide consisting essentially of an amino acid sequence of glucosyltransferase comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491,  
25 glutamate 489, an equivalent of aspartate 562, an equivalent of aspartate 567, an equivalent of histidine 561, an equivalent of tryptophan 491, an equivalent of glutamate 489, and combinations thereof, and which is of sufficient length to

raise an immune response in the mammal, to the mammal, which thereby provokes said immune response.

13. A method according to Claim 12 wherein said immune response results in reduction of the colonization or accumulation of mutans streptococcal strains in the mammal to whom the peptide is administered.
14. A method of immunizing a mammal against dental caries comprising administering a peptide consisting essentially of an amino acid sequence of glucosyltransferase comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, an equivalent of aspartate 562, an equivalent of aspartate 567, an equivalent of histidine 561, an equivalent of tryptophan 491, an equivalent of glutamate 489, and combinations thereof, and which is of sufficient length to raise an immune response in the mammal, to the mammal.
15. An immunogenic composition comprising a peptide consisting essentially of at least one amino acid sequence of glucosyltransferase comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, an equivalent of aspartate 562, an equivalent of aspartate 567, an equivalent of histidine 561, an equivalent of tryptophan 491, an equivalent of glutamate 489, and combinations thereof, and which is of sufficient length to raise an immune response in a mammal to whom it is administered.
16. An immunogenic composition according to Claim 15 wherein the amino acid sequence is selected from the group consisting of:
  - a) ANDHLSILEAWSNDTPYLHD (SEQ ID NO: 1); and
  - b) VPSYSFIRAHDSEVQDLIA (SEQ ID NO: 2);.
17. An immunogenic composition according to Claim 15 wherein 2 or more of the peptides are present and arranged on a core matrix of 3 or more lysines.

18. An antibody which binds to an amino acid sequence of glucosyltransferase comprising an amino acid selected from the group consisting of aspartate 562, aspartate 567, histidine 561, tryptophan 491, glutamate 489, an equivalent of aspartate 562, an equivalent of aspartate 567, an equivalent of histidine 561, an  
5 equivalent of tryptophan 491, an equivalent of glutamate 489, and combinations thereof.
19. An antibody according to Claim 18, wherein the antibody specifically binds to the amino acid sequence.